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Malaysia Commercial Flight Passengers' Safety (NEWS)

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Abstract— **This paper deals with the application of a new method of survey on public opinion, developed by the second author and called People NEWS (Needs, Expectations, Wants and Satisfaction), to have a better understanding about the customers' NEWS on air travel safety and process in Malaysia. This paper will concentrate on the important aspect of safety for check-in and check-out procedure in the air travel process in Malaysia. The analysis of quality function deployment (QFD) will apply to understand the customers' safety requirements and failure mode and effect analysis (FMEA) to identify potential failures.**

Keywords-customer satisfaction; NEWS, quality function deployment; failure mode effect analysis;

I. INTRODUCTION

People NEWS is a new method of survey on public opinion by the second author. NEWS stand for needs, expectations, wants and satisfactions. Needs refer to a condition or situation in which something is necessary, expectations refer to consider likely, wants refer to desire greatly, and satisfactions refer to the fulfillment of a desire. Respondents will be asked for their opinions regarding needs, expectations, wants and satisfactions for the product and services provided by a flight company.

The results from traditional methods for survey are not really give the whole picture from the respondents' views. It is caused, for example, by questionnaire design where respondents are usually guided with answers and scales; some options are given to be choosen. Respondents are not free to give their ideas because they have to follow the format of the questionnaire. So, it is hard to get the true opinion that comes from the respondents' heart. By using this method, respondents are given hundred percent freedom to express their opinion. They are really free to write all what they want to. Thus, a better understanding about their opinion can be obtained and therefore the quality of business and services can be improved more effectively. This method is already used by some governments in Malaysia with satisfactory results but, due to the confidentiality, it cannot be reported here.

In this study, the customer's NEWS on the safety in air travel procedure or process in Malaysia will be reported. The need for security and safety at the airport is highly concerned after the attack of September 11 in New York. According to [1], passengers in Europe and Asia will choose a carrier or airlines for many reasons including service reliability, service quality, flight schedules, fares, connections, frequent flyer programs, comfort, safety and company policies. Safety is one of the main reasons passengers choose from the carrier.

The air travel process in Malaysia consists of ten steps and can be summarized in Table 1.

TABLE I. THE AIR TRAVEL PROCESS IN MALAYSIA

Purchase ticket → Check-in with or without baggage → Boarding pass check → Immigration (International pax only) → Airport security check → Boarding Gate → In the flight → Arrival Gate → Collect Baggage → Custom

According to Malaysia Airport Holdings Berhad (MAHB), the most important part is at the check-in step. In this step the security level is very high to make sure that the procedure is smooth and the passenger and their baggage safety are guaranteed. In this paper we will concentrate more on the check-in and check out steps because the procedure in these steps are more important in aviation safety and national security. The customer's NEWS in flight safety and potential failures in fulfilling their NEWS will be both studied and reported.

II. RESEARCH METHODOLOGY

A. Data Preparation

In this study, 100 respondents were participated. Questionnaires were sent to the majority of the respondents (73%) them via email after they have agreed to participate. Another 27% of the respondents were interviewed on the spot.

B. Questionnaire Development: People NEWS

The questionnaire consists of four parts, namely, 'needs' part, 'expectations' part, 'wants' part and 'satisfactions' part. The respondents are required to answer by writing, in the questionnaire, their opinion about air travel in Malaysia. They are free to give their opinion because the questions are open ended.

Their responses are then collected and analyzed by using standard approaches in quality improvement such as, for example, affinity analysis and Pareto analysis. From affinity analysis, these responses can be categorized into nine, namely, safety, tickets, price, foods and drinks, services, facilities, time management, check-in and check out, and luggage. Based on these categories, in what follows further results will be reported.

C. Data Analysis

1) Quality Function Deployment (QFD)

According to [2], who originally developed QFD in Japan in 1966, QFD is defined as a method to transform user demands into design quality, to deploy the functions forming quality, and to deploy methods for achieving the design quality into subsystems and component, and ultimately to specific elements of the production process. The technique used in QFD yield graphs and matrices. QFD helps transform customer needs (the voice of the customer [VOC]) into engineering characteristics (and appropriate test methods) for a product or service, prioritizing each product or service characteristic while simultaneously setting development targets for product or service.

The quality function deployment (QFD) is a tool that can be used in any process improvement to meet the needs of the customer and translating the customer requirement into basic requirement [3]. As an example, we can see in [4] the use of QFD to allow all employees in the organization to participate in the design of new products. One of the benefits using QFD is getting a better understanding of what the customer wants. Actually, QFD is multipurpose. For example, Keller in [5] defines QFD as a detailed methodology for linking customer requirements with internal process and product requirement. Brussee [6] used simplified QFD foam for measuring the way of quantifying design options against customer needs.

The traditional QFD consists of four forms, i.e., "House of Quality", "Part Deployment", "Critical-to-Customer-Process Operations" and "Production Planning". These traditional methods need more time and effort than the simplified QFD. The advantage of the simplified QFD is that it can be used on every project or change. It is more realistic compared to the traditional QFD. The form is designed to get input with a minimum of hassle.

The steps in doing the simplified QFD are as follows:

i. Make the list of the customer needs.
ii. Rate the needs with a value from 1 to 5. The lowest value 1 shows that the need is not very important and the highest value 5 shows that the need is very important.
iii. The customers' needs and ratings are listed down (on the left-hand side of the simplified QFD form as can be seen in Table 2).
iv. Across the top of the simplified QFD form are the potential actions to address the customers' needs.
v. Rate the potential actions by using the scores 0, 1, 3 and 9 to show how strongly the potential actions address the customers' needs. The lowest value 1 addresses some important relationship and lastly value 9 addresses much importance or strong relationship. The value 0 indicates that it does not affect the customers' need.
i. Multiply the potential actions with the corresponding customers' needs value. The second column next to the rating value under each potential action is the result for each customer's needs. See Table 2.
vi. The value under each potential actions are summed and entered into the total rows at the bottom of the form. See Table 2. The solutions with the highest values are the preferred potential actions to address the customers' needs.

2) Failure Mode Effect Analysis (FMEA)

Failure mode and effect analysis (FMEA) is a method that facilitates process improvement. By using this method, an organization can identify and eliminate any concerns in the early development of a process or design. It can also provide a form of risk analysis. The flight company will work with the supplier to implement FMEA to make sure that the quality of procured parts or services are improved [5].

Stamatis in [7] defines FMEA as a methodology that can help to identify the potential failures and to recommend corrective actions for fixing those failures before they reach

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the customers. According to [6], a simplified FMEA can help to generate savings through cost avoidance. FMEA is usually used in conjunction with the simplified QFD. The simplified FMEA can anticipate things that can go wrong even if a proposed project, task or modification is completed as expected. The simplified FMEA can give a critical look before it is implemented. The most important thing in FMEA is to identify affected components or issues downstream.

The steps in doing the simplified FMEA are as follows:

i. Make the list of possible things that can go wrong.
ii. Rate the importance of the potential failures. The score used in this rating is from 1 to 5. The lowest value 1 means that the importance is minor and the highest value 5 means that the importance is a critical.
iii. Across the top of the simplified FMEA form are the list of solutions to address the concerns (see Table 3).
iv. Rate each potential failure by using 4 different scores 0, 1, 3 and 9. The score 0 addresses the small importance or relationship, 3 addresses some importance or relationship and lastly value 9 addresses much importance or strong relationship.
v. Multiply the potential failures importance rating with the value rated for a list of solutions. The second column next to the rating value under each solution is the result for each potential failure. See Table 3.
vi. The value under each solution are summed and entered into the total rows at the bottom of the sheet. The solutions with the highest values are the preferred solutions to address the potential failures.

III. RESULT AND DISCUSSION

A. *Quality Function Deployment (QFD)*

Using the simplified QFD form as suggested in [6], the customers' NEWS was listed according to the category check-in and check out. The customers' NEWS was categorized into four groups. They are counters, time management, services and self check-in. Table 2 is the simplified QFD form for NEWS, check-in and check out process.

For the 'counter' groups, respondents want more counters to open, improve the process for check-in and all in one call center. For the 'time management', they want a fast and smooth check-in and also consider for the new and faster system. For the 'services', they wants the availability of an airline personnel at self check-in counters, the convenient process and the longer duration for check-in. Lastly, for 'self check-in', customers need more self check-in services and counter in Malaysia airports.

TABLE 2 SIMPLIFIED QFD FORM

Customer importance: 5 Highest to 1 lowest		Customer Needs	Customer Importance	Efficient staff		Efficient system		Efficient services		Efficient facilities	
NEWS for check in & check out process	Counters	More check in counters	2	1	2	1	2	3	6	3	6
		Improve the check in process and counters	4	9	36	9	36	9	36	0	0
		All –in-one call centre	1	0	0	0	0	1	1	1	1
	Time Management	Fast and smooth check-in	5	9	45	9	45	9	45	3	15
		Consideration for new and faster check in system	1	0	0	3	3	1	1	0	0
	Services	Availability of airline personnel at self-check in counters	4	9	36	9	36	9	36	0	0
		Convenient process check-in	4	3	12	9	36	9	36	9	36
		Lengthen the duration for check-in	1	0	0	0	0	1	1	0	0
	Self Check in	Do more self check in	5	3	15	9	45	3	15	9	45
		More counter or kiosk for self check in the airport	2	0	0	1	2	3	6	3	6
	Total				146		205		183		109
	Priorities				3		1		2		4

Then the customers' NEWS is rated according to the customers' importance. In this part, we use the frequency of responses from questionnaire to make the rating. The score used in this rating is from 1 to 5. The potential actions are suggested according to the customer's NEWS. The efficient staff, systems, services and facilities are the potential actions to overcome the customers' NEWS. These potential actions are rated for each customer's NEWS by using 3 different scores.

The next step is to multiply the customers' importance rating with the score rated for potential actions for each customer NEWS. The second column next to the rating value under each potential action is the result for each customer's NEWS. Lastly, total up these results by each potential action. The highest value of potential actions is the solution to address the customers' NEWS. In this case, the highest value is 205 for efficient systems. It means that efficient system is the best solution for customers' NEWS.

B. *Failure Mode Effect Analysis (FMEA)*

Using the simplified FMEA form as suggested by [6], the list of possible things that can go wrong are prepared. There are six possible potential failures. The concerns are about the less counter for check-in and check out, the process is not improved, the time for this process is too long, the staffs are limited, the process is very tedious and self check-in is not allowed. Table 3 shows the simplified FMEA form for customers' NEWS, check-in and check out process.

The importance of the potential failures are rated. In this part, we use the frequency of the responses from questionnaire for the rating. The score used in this rating is from 1 to 5. The solutions are suggested to overcome the potential failures. The most important messages from the customers are (i) more counters to be open, (ii) improve the process during check-in and check out, (iii) reduce the time of the process, (iv) more

staff are available at each counters, (v) smooth process and (vi) encourage more passengers to do self check-in. These solutions are rated for each potential failure by using 3 different values.

TABLE 3 SIMPLIFIED FMEA FORM

Customer Importance: 5 Highest to 1 lowest / Concerns	Ratings	More counters will be open		The process for check in and check out will be improve		Less time for check in and check out		More staff at each check in counters		Smooth process for check in		Encourage more to self check in	
Less counter for check in and check out	1	1	1	0	0	0	0	0	0	0	0	1	1
The process of check in and check out is not improve	4	3	12	9	36	3	12	3	12	3	12	0	0
The process of check in and check out is too long	5	3	15	3	15	9	45	0	0	3	15	0	0
The staff at check in counters are limited	3	0	0	0	0	0	0	9	27	0	0	0	0
The process of check in is tedious	2	0	0	3	6	3	6	1	2	9	18	3	6
The self check in is not allowed	5	0	0	0	0	0	0	3	15	0	0	9	45
TOTALS			28		57		63		56		45		52
Priorities			6		2		1		3		5		4

The next step is to multiply the potential failures importance rating with the value rated for a list of solutions. In Table 3, the second column next to the rating value under each potential action is the result for each potential failure. Lastly, total up these results by each list of solutions. The high scores are then prioritized, with the highest is 1 which means 'considered for implementation'. In this case, 'less time for check-in and check out' is the most important consideration for implementation.

Based on the above results, 'efficient system' is the best solution for customers' NEWS. While 'less time for check-in and check out' is the most important consideration for implementation concern to the customers' NEWS.

IV. CONCLUDING REMARKS

Customers' NEWS method is a more convenient way to study public opinion compared to the traditional questionnaire. In customers' NEWS method, respondents were asked about their needs, expectations, wants and satisfactions only and they are free to answer and express what they are thinking. They can give more suggestion, idea and criticism accordingly. In the traditional questionnaire, the question is designed by using the mindset of the researcher. Thus, the respondents are not free to express their ideas and what they are thinking because their actual answer may be different from that provided by the researcher. The advantage of using customers' NEWS compared to traditional questionnaire is the freedom to express their opinion which reflects human right. As a human being, people have the right and freedom to express their feelings or thinking towards anything. Customers' NEWS method helps us to express our ideas without any boundaries. The responses are then pure and honest. Therefore, it will give better results in analysis and can minimize bias as it does not come from the mindset of the researcher.

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